

# List of the Saber 11 Test, admission exam, academic average, saber protest of students of the psychology program of the University of Magdalena

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## Abstract

**Introduction:** The quality of higher education in Colombia is measured through the indicators that the Saber-Pro Tests show, this exam evaluates generic and specific competencies of the future professional in psychology, therefore, in this research the analysis of the relationship between the academic average, the results obtained in the admission exam, the Saber 11 Tests, the Saber Pro Tests and the academic average of Psychology students at the University of Magdalena. **Methods:** All students who were admitted between 2012 and 2016 were selected, being 246 female and 86 male, multivariate analysis was used. **Objective:** to establish the relationship with performance in the SABER PRO standardized test for psychology. **Results:** The analysis that was carried out was with the 2012 admission cohort by Chi-square of Saber-Pro and the variables of the scores and sociodemographics, finding a statistically significant association between the Saber Pro quartiles and the quartiles of the scores of admission.

**Keywords:** Higher education, Saber Pro, Saber 11, Colombia, academic performance.

## Relación de la prueba Saber 11, examen de admisión, promedio académico, prueba saber pro de estudiantes del programa de psicología de la Universidad del Magdalena

### Resumen

**Introducción:** la calidad de la educación superior en Colombia se mide a través de los indicadores que arrojan las Pruebas Saber-Pro, este examen evalúa competencias genéricas y específicas del futuro profesional en psicología, por ello, en esta investigación se realizó el análisis de la relación entre el promedio académico, los resultados obtenidos en el examen de admisión, las Pruebas Saber 11, las Pruebas Saber Pro y promedio académico de los estudiantes de Psicología de la Universidad del Magdalena. **Métodos:** se seleccionaron todos los estudiantes que fueron admitidos entre el año 2012 y el 2016, siendo 246

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del género femenino y 86 del género masculino, se utilizó análisis multivariado. **Objetivo:** establecer la relación con el rendimiento en la prueba estandarizada SABER PRO para psicología. **Resultados:** el análisis que se realizó fue con la cohorte de ingreso 2012 por Ji-cuadrado del Saber-Pro y las variables de los puntajes y las sociodemográficas, encontrando una asociación estadísticamente significativa entre los cuartiles de Saber Pro y los cuartiles de los puntajes de admisión.

**Palabras clave:** Educación superior, Saber Pro, Saber 11, Colombia, desempeño académico.

## introduction

In Colombia, the central government has established that university institutions must strive for high quality of higher education by applying the Saber Pro exams to students. The purpose of these state exams is to measure the quality of higher education in an attempt to evaluate the quality of public education services and their role in inspection and monitoring (Delgado, 2013). This evaluation tool proposed by the Ministry of National Education (MEN, in Spanish) is used to evaluate skills and performance of future professionals in Colombia. For this reason, in 2002 the MEN began to apply this test for the first time with students of Mechanical Engineering, Law, and Medicine. These careers performed the tests in the second corresponding year and the results obtained helped to know the advantages and disadvantages of the different degree courses that participate in the evaluation. The Colombian Institute for the Promotion of Higher Education (ICFES, in Spanish) convenes universities throughout the country to analyze the schools, their professionals, and other members of the academic community to jointly reformulate a test that was applied to all areas of knowledge, including: health sciences, architecture, urbanism, social sciences, and humanities.

In the second year after this meeting, in 2004, other academic programs joined. Forty-two programs from different universities in Colombia participated in this evaluation. Currently, 55 undergraduate programs from different

universities meet the requirements of the state exam. So far, the ICFES (2012, 2016a, 2016b, & 2016c) continues to apply the exam normally to 55 programs. To seek regular compliance with the schedule established since 2003, the exam has been reviewed many times by different educational institutions in the country.

From the revisions, the MEN redefined the structure of the test in 2009. Currently, the ICFES has a new structure thanks to the legal process that the Congress of the Republic was able to carry out, creating a new law to regulate the state exam. Therefore, the MEN issues new higher education standards so that, based on them, the structure of the Higher Education Quality Exams (ECAES, in Spanish) is evaluated (Delgado, 2013; Colombia Aprende, 2017).

Therefore, the government turned the ECAES into the Saber Pro (Saber Professional) test. With this new reorganization, the MEN has been able to achieve the best way to evaluate the professional training that students have acquired throughout the learning process and to emphasize the results of the ECAES as a contribution to readjust educational policy and improve the quality of higher education and promote decision-making on these issues.

These results are nothing more than performance indicators by competencies and that is why Torres et al., (2008) express their concern by raising the voices of some students who consider that evaluation should take more relevance in educational and pedagogical expressions. The authors believe that "research in evaluation is to understand a culture, a way of reading and projecting the world" (p. 117). This is only an expression of the emergence of the evaluation system, which will allow orienting universities about the importance of evaluation, since they have no idea about the essence of what is evaluated and for what purpose it is evaluated in higher education.

Specifically, the large-scale evaluation of higher education began in 2003, first applying ECAES to 27 different programs and then to 55 programs in 2008; therefore, the results awakened people's interest in learning. The first stage, as well as the new legal requirements, motivated the restructuring of these exams,

which since 2009 are called SABER PRO and are mandatory requirements for degree programs. This is the first time that the [ICFES \(2016a\)](#) has provided comparable results for all higher education ([ICFES, 2016b](#); [Oficina Asesora de Comunicaciones, 2013](#); [ICFES, 2016c](#)).

In this sense, [Tirado \(2017\)](#) together with the ICFES join efforts to enable the construction of citizenship, emphasizing generic and specific competencies, through knowledge and skills that are framed in the understanding of the environment and inclusive coexistence within the framework proposed by the political constitution of Colombia. Therefore, the exercise of citizenship should be based on the active participation of citizens and their communities, since a capable citizen is a person who understands their social and political environment, understands their rights and obligations; in addition to being interested in community affairs, it develops the capacity to reflect on social problems; participate in the search for solutions to social problems, and seek the welfare of his or her community.

It is here where the above becomes increasingly relevant, addressing the need to improve more and more the evaluation process of specific competencies of undergraduate students in the psychology program. This is done through the analysis of psychological problems, which the [MEN \(2010\)](#) explains that the proposal consists of identifying the levels of understanding that future psychologists have, considering biological and sociocultural factors, and the level of understanding of the process of evaluation and intervention of psychological problems in social, clinical and health, educational, and organizational environments.

To assess these skills by designing and conducting psychological intervention questions, students are required to identify problems related to psychological vulnerable situations, define the purpose of the intervention, define implementation and evaluation strategies, and communicate the results ([ICFES, 2016](#)). Therefore, the new exams are designed to evaluate two types of competencies: generic and specific (governed since 2009 for the Higher Education State Exams—Law 1323 and Decree 3963—which

points out the need to adapt the design of the instruments to the parameters established in the Law).

Up to this point the task remains arduous, since it is important to evaluate the intrinsic factors of the evaluation, but the ICFES proposes an alternative for the design of an exam. In this matter, the Colombian Association of Psychology Schools (ASCOFAPSI, in Spanish) takes up the challenge and prepares an initial document on basic skills, in 75% of the students in each academic course, which can be analyzed from the perspective of the general skills they have developed so far in the exam and from other fields or training courses (text of the call made by the ICFES in 2010, by the ASCOFAPSI in 2012, cited by [Tirado, 2017](#)). Therefore, the ASCOFAPSI is the entity selected by the ICFES, to advance a proposal on the fundamental competencies of students, convening a team of academics to develop a proposal to be submitted for discussion by the ICFES.

From this proposal arise some reforms in the Saber Pro exams and they are: that they should be mandatory, evaluate generic competencies such as critical reading, quantitative reasoning, civic culture and understanding of the environment, writing and English, specific competencies related to problems common to different programs, rather than specific curricular contents, which are used to evaluate students from different programs, even from different areas of knowledge common to groups of programs, test application schedule and modules that will be mandatory for students, who comply with the minimum characteristics and the presentation of results.

The test has been evolving at a conceptual and practical level and continues to be a topic of interest due to the deficiency in the results that vary each year. Although there are studies that support the impact of reviewing the relationship between the ICFES scores, admission scores, academic average and Saber Pro tests, questions arise regarding the factors that influence the low performance of the test at the national level.

Another aspect of the evaluation is the efforts of the MEN to recommend scholarships among

universities in the department chosen by Colciencias for young researchers. As a result, the ICFES continues to position the Saber Pro test as a tool to measure the quality of higher education and the skill level of students under international standards ([MEN, 2010](#)).

These evaluative attempts by the State have led to various investigations for [León et al., \(2012\)](#). The relationship between reading comprehension, intelligence, and performance in Saber Pro tests in a sample of university students of the Psychology Program of the Universidad de la Costa (CUC) reveal that there is no significant correlation between the scores obtained in reading comprehension in the Saber Pro test and the results of the tests that evaluate working memory (PHC-Reading Comprehension and RIAS) and verbal and general intelligence.

In addition to the evaluation of memory and reading comprehension, other authors ([Gil et al., 2013](#)) consider the results in the national test of quality in higher education (Saber Pro). The authors used information from 4,498 medical students evaluated in the Saber Pro test in 2009, using a hierarchical model which evaluated 40 medical schools. The correlation between the characteristics of students and universities and the scores obtained in the test found average scores by universities of the Saber Pro 2009 test for medical students with an index of 100.4, in a range between 84.3 and 110.8 points and the variability of test scores was explained by 29% by differences between universities; therefore, they conclude that official universities and medical schools with their own university hospitals obtained better results on average, and also that the provision of medical professional courses was associated with lower scores.

[Bahamón and Reyes \(2014\)](#) conducted a characterization of the intellectual capacity, sociodemographic and academic factors of students with high and low performance in the Saber Pro exams (2012) at the Universidad Simón Bolívar. The authors highlighted that the scores reported by the ICFES for the periods between 1 and 2 of 2012 and the data reported by the psychology program of the University in a sample of 68 students in ninth and tenth

semester in ages between 21 and 52 years, applying descriptive statistics and T-student test, determined the intellectual capacity of the students and most of them were classified with scores corresponding to the medium term (36.8%) and above medium (30.9%), while the lowest scores placed them in the terms of deficient (4.4%) and superior (1.5%). As for the analysis of the data in terms of performance on the Saber Pro tests, the students with the best performance were in the above average (60%) and average (30%) terms, in contrast to the data of students with lower performance, this distribution was in the category of average and below average (31%). In relation to socio-demographic characteristics, the authors concluded that the data in terms of performance in the Saber Pro tests with students with better performance are mostly in the above average (60%) and average (30%) terms, therefore, students with better performance have specific socio-demographic characteristics, superior intellectual capacity, good academic performance, professional interests related to the areas of the career, and adequate study habits and techniques.

The above could indicate that students who have better academic performance obtain better scores in the state test in higher education; therefore, [Isáziga et al., \(2014\)](#), through the support of the ICFES, believe that academic intervention is the construction of a society with quality. They propose to conduct an analysis of the added value in the Colombian formative process. The authors considered the analysis of the results of the evaluation of the Saber 11 and Saber Pro tests by Colombian regions (Corpes), based on the added value (VA) methodology. This study showed that in the reading comprehension and language component, all regions had values below 0.05 (degree of significance), which indicates that the correlation is non-zero (there is an association), with a 95% level of reliability. The authors analyzed a significant association between the %efecSaber11 and its subsequent %efecSaberPRO; which further highlights the non-existence of a very large correlation between the two performances. In the Corpes regions analyzed, there is a notable improvement in the percentage of maximum

effectiveness before and after university education (%efecSaberPRO was higher than %efecSaber11), therefore, there is interest in continuing to conduct this type of study.

These two conjunctural points establish a meeting point to understand the reason for the evaluation of the performances or the deficiencies of the scores, therefore, [Ramírez \(2014\)](#) analyzes other socio-demographic factors (socio-economic, educational, level of training, and sex) that could be associated with the academic performance of students who take the Saber Pro test. In order to identify the association, the author used the databases provided by the ICFES, from which she formed a working database with 4,031 observations, 2,145 are women (53.2%), 1,886 are men (46.8%) and 95% of them are single. The average age was 21 years. The type of tests taken were Saber Pro 2009 test and Saber 11 test in 2005 and 2006. The methodology used was descriptive, using frequency distributions and inferential analysis and hypothesis testing to verify the independence between variables. In addition, a multiple linear regression analysis was implemented to determine the factors associated with academic performance, according to sex and level of education of the students evaluated with the Saber Pro 2009 test.

In the results, the author found that, according to the level of education, 15% are students in professional technical programs, 63% are in technological programs and 22% are in professional programs. Another relevant data from the study conducted by Ramírez was that 89% of the Colombian population belongs to strata one, two, and three ([Conpes 3386, 2005, as cited in Ramírez, 2014](#)), while in the population she used were 84% students belonging to those strata and the remaining percentage at 15% which is distributed in the three highest strata, the level of education of mothers is comparatively higher than that of fathers, since 69% of the students' fathers have not completed higher level studies or have no studies at all or have some type of primary or secondary studies; while the percentage for the mothers is 74%. In conclusion, this study shows that, regardless of the level of education or sex of the students, prior

academic performance, measured in the results of the Saber 11 tests in the areas of chemistry, physics, mathematics, language, philosophy, biology, and languages, is strongly and positively associated with the academic performance of the students who took the 2009 Saber test, that previous academic performance measured in the scores obtained in the Saber 11 tests is strongly and positively associated with the performance of students regardless of their sex or level of education, and that the socio-economic and educational variables, in comparison with previous performance, turned out to be weakly associated with performance in higher education.

Also, [Timarán et al., \(2016\)](#) inquired about the trends of academic performance in generic competencies-Saber Pro tests, performing a preliminary statistical analysis of the data in order to obtain the trends of academic performance of students, in the four generic competencies of the Saber Pro 2011-2 tests, in terms of sociodemographic, economic, academic, and institutional variables of the students, the analysis of statistical measures yielded a comparison of scores in general skills. The result showed a high correlation in quantitative reasoning critical reading and English critical reading ( $r > 0.5$ ). Written reading and quantitative reasoning critical reading in English show a moderate correlation ( $0.3 < r \leq 0.5$ ), and the correlation between quantitative reasoning and written expression skills of written communication in English is very low ( $r \leq 0; 3$ ). In terms of sex and academic performance in general skills, males outperform females in all skills except writing skills (A: high). In terms of marital status, females perform better than males in general skills. Unmarried people perform better in all tests (A). Performance in married, separated, or divorced is low (B). Among the four skills, widowed and cohabiting students showed a B performance in critical reading and writing, while in the quantitative reasoning module, unmarried students were in the intermediate B group and in the last C group.

Apart from this, [Betancourt and Frías \(2015\)](#) change perspective and focus on specific competencies by area of performance, such is the

case of the argumentative competencies of law students in the framework of the Saber Pro tests at the Universidad Sergio Arboleda in the city of Bogotá. The researchers found that in generic competencies and citizenship competencies they had an average of 3 (it represents an average level on a scale from 1 to 5). In writing 5 (on a scale from 1 to 8, a good use of language is appreciated, although errors can be found in the application of some spelling rules), in English A1 (is able to understand and use everyday expressions) and in critical reading 3, in contrast to the above, the authors compared the results with the 2012-2014 period with other students (81 participants) of the Law Program and in the analysis of the competencies the authors highlighted the citizenship competencies, the students obtained an average of 2 (represents a low level on a scale from 1 to 5), in writing an average of 5, in English an average A1, in critical reading an average of 2 and in quantitative reasoning an average of quintile 2 (40%). This indicates that the critical reading scores dropped, and the other scores remained the same. In conclusion, the students need a better linguistic training, and this is achieved by improving the curriculum, restructuring the state evaluation models and the student qualification policies, and improving the theoretical references of the career, since, according to them, this will lead to the pedagogical orientation making it possible to rescue and validate the criteria of a student as a citizen and as a professional in training.

The Universidad de Nariño evaluated the added value related to the Saber 11 and Saber Pro-2010-2014 tests and found that the university generated an added value of 10% to students in the period studied. This indicates the educational effectiveness and the impact of the teachers' teaching they have had during the progress of the university career (Burgos et al., 2019).

From the above, in this research, it was proposed to interpret the relationship of the results obtained in the admission test, accumulated from the 1st semester, and Saber Pro with the academic average of students from the years 2012 to 2016, in order to analyze the value of some variables that were analyzed in the

student before starting their university studies, allowing to establish the relationship with the performance in the SABER PRO standardized test for psychology. This analysis could be of interest for selecting candidates in admission processes given both academic and personal characteristics for university entrance.

## Method

### Design

It is quantitative because it is based on quantifying the social phenomena presented to then create a conceptual framework that fits the detailed problem and, therefore, a series of hypotheses are analyzed that have relationships between the variables observed in the deduction. This method usually tends to generalize and standardize the results. The type of design is not experimental. The design collects data passively without introducing changes or treatments, i.e., there is no deliberate manipulation of the variables, and it is cross-sectional because the data were only collected at a single point in time during the research (Bernal, 2010).

### Participants

The unit of analysis consisted of 332 students admitted and enrolled during a period of five years in the Psychology Program from 2012 to 2016 of different sexes, age, marital status, socioeconomic status, place of origin and school of origin.

### Instruments

Information on the total of 1,020 admitted students was collected through the existing databases of the Admissions Department and the virtual platforms offered by the ICFES.

The data were analyzed from the information provided by the Admissions Department of the Universidad del Magdalena. The sociodemographic characterization of the psychology students of the cohorts from 2008 to 2012 was carried out with the variables: sex, type of school, department of origin, and socioeconomic stratum (see Table 1 and Table 2).

## Procedures

### Phase 1. Request and Review of Information

During this stage of the investigation, the official requests for the provision of information were made to the Admissions Department and Academic Registry of the Universidad del Magdalena and the ICFES virtual platforms on the web page were reviewed. Subsequently, the information was reviewed in such a way that it was verified that it is the requested and complete.

### Phase 2. Information Processing

Databases were prepared for each of the study variables, which allowed the information to be organized year by year and by subject of major interest for the project, which made it possible to establish an orderly and clear database.

### Phase 3. Data Analysis

For the analysis of the data, central tendency statistics were applied and for the comparison between the variables proposed in the project Pearson's correlation index will be applied, which is a statistical test to analyze the relationship between two variables measured at an interval level ([Bernal, 2010](#)).

## Data Analysis

Pearson correlation was performed with the continuous variables between Saber Pro scores

and admission scores, 1st semester cumulative and overall cumulative average.

A chi-square analysis of the sociodemographic variables was performed with the continuous variables (the scores), but obtaining ranges between them, based on the quartiles of each score.

## Results

The following results are presented, performing first a descriptive analysis and finally an analysis of the correlations between the variables proposed in the study. The first objective corresponds to the sociodemographic characteristics related to sex, department of origin, school of origin, and socioeconomic level of the students of the Psychology Program from 2008 to 2016. It is observed that the female sex is most of the population with about 74%, the majority comes from a public school (72%), the majority comes from the department of Magdalena (66%), and the majority belongs to socioeconomic strata 1 and 2 (40 and 43% respectively) (see Table 2).

Regarding the results of the admission exam, with respect to this variable, it was found that,

**Table 1**  
*Operationalization of the Quantitative and Qualitative Variables*

	Variable	Categorization or scale
<b>Quantitative</b>	Saber Pro scores 2008 to 2011	0 a 13
	Saber Pro 2016	0 a 300
	Admission score	0 a 1000
	Accumulated 1st semester	0 a 500
	Overall cumulative average	0 a 500
<b>Qualitative</b>	Sex	Female or male
	Type of school	Public or private
	Socioeconomic stratum	1 to 5
	Student's Department of origin	Magdalena or outside the department of Magdalena

*Note: This table shows the organization of the qualitative and quantitative variables analyzed in the study.*

during the year 2008, no report of admission score data was obtained. On average, the admission scores were between 608 points (year 2013) and 651 points (year 2016). The boxplot (see Figure 1) indicates that the highest average and median were found in 2012 and 2016.

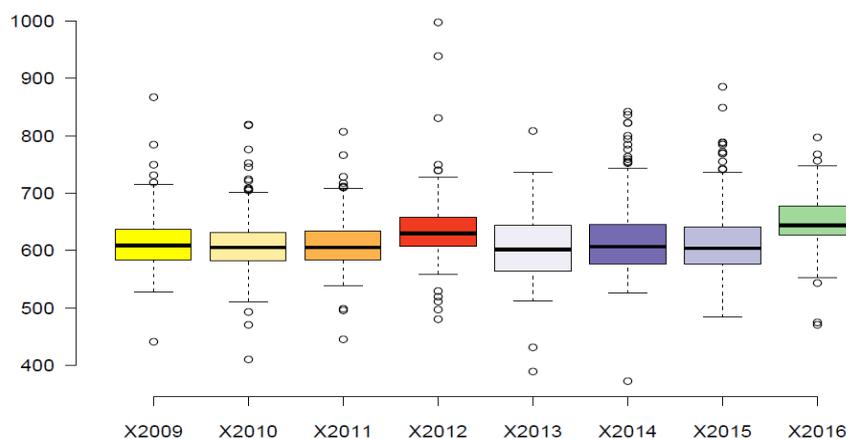
In Figure 2, the overall cumulative average is shown, and it was observed between 341 (year 2013) and 401 points (year 2011). This indicated that, from 2013 to 2016, there has been a lower median as well as 50% of the accumulated, i.e., the data between the 1st quartile and the 3rd

**Table 2**  
Sociodemographic Characteristics of Students in the Psychology Program 2008-2016 Entry Cohorts

	Variables	Frequency	Percentage
Sex	Female	246	74,10%
	Male	86	25,90%
Type of school	Private	93	28,01%
	Públic	239	71,99%
Student's background	Outside Magdalena	113	34,04%
	Magdalena	219	65,96%
Socioeconomic stratum	1	133	40,06%
	2	143	43,07%
	3	50	15,06%
	4	4	1,20%
	5	2	0,60%

Note: This table presents the characterization of the sociodemographic data that were used for the analysis of the scores of the cohorts of entrants from 2008 to 2016.

**Figure 1.**  
Boxplots Admission Scores 2009-2016

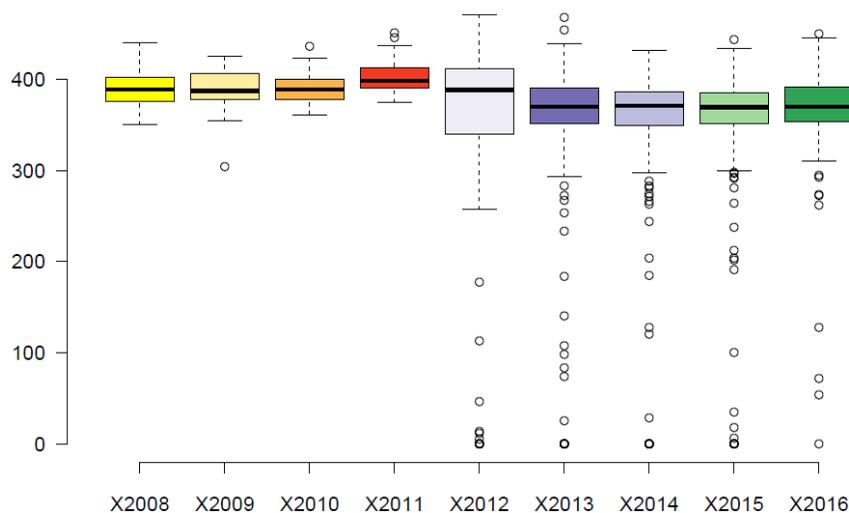


Source: Own elaboration

quartile. This is consistent with the cumulative average between 2008 and 2012 which were in a range between 389 and 401 points, being the years with the highest average.

In Table 3 and Figure 2, the cumulative average for the first half of the year ranged from 330 points (years 2012 and 2013) to 365 points (year 2009). This indicates that, in 2009, the

**Figure 2.**  
Cumulative Average 2008-2016



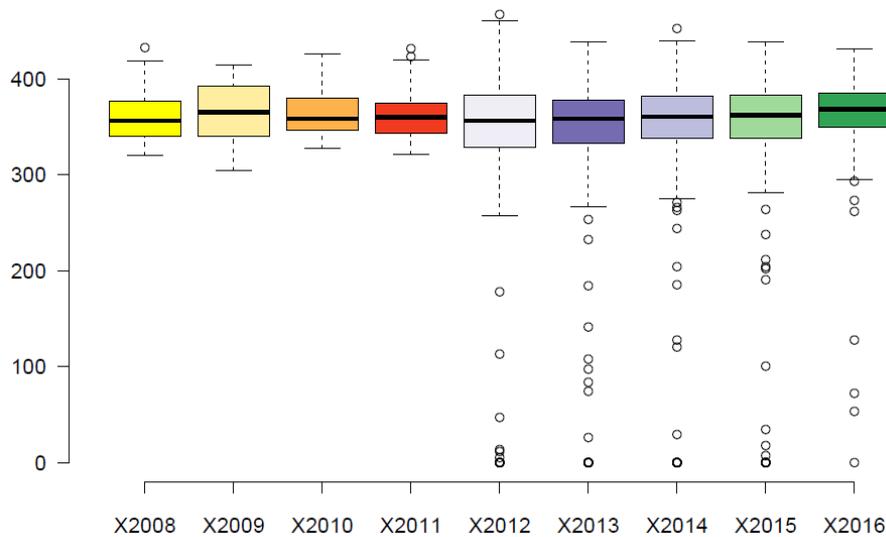
Source: Own elaboration

**Table 3**  
Overall Cumulative Quartiles Between the Years 2008-2016

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Upper whisker	440.00	425.00	423.00	437.00	471.00	439.00	432.00	434.00	445.00
3rd quartile	401.50	406.50	400.00	412.00	411.00	390.00	386.00	385.00	391.00
Median	389.00	387.00	389.00	398.00	388.00	370.00	370.50	369.00	369.50
1st quartile	375.50	377.50	378.00	390.00	340.00	351.00	349.00	351.00	353.00
Lower whisker	350.00	354.00	361.00	374.00	257.00	293.00	297.00	300.00	310.00
Nr. of data points	71.00	55.00	55.00	57.00	139.00	185.00	268.00	229.00	138.00
Mean	389.63	389.51	390.40	401.14	350.17	341.12	350.08	349.79	362.86

Note: The table shows the cumulative quartiles in general, between 2008 and 2016.

**Figure 3.**  
Cumulative Average First Half 2008-2016



Source: Own elaboration.

**Table 4**  
Cumulative Quartiles First Half 2008-2016

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Upper whisker	418.00	414.00	426.00	419.00	460.00	438.00	439.00	438.00	431.00
3rd quartile	377.00	392.00	379.50	374.00	383.00	378.00	382.00	383.00	385.00
Median	356.00	365.00	358.00	360.00	356.00	358.00	360.50	362.00	368.00
1st quartile	340.00	339.50	346.50	343.00	328.00	333.00	338.00	338.00	349.00
Lower whisker	320.00	304.00	327.00	321.00	257.00	267.00	275.00	281.00	295.00
Nr. of data points	71.00	55.00	55.00	57.00	139.00	185.00	268.00	229.00	138.00

Note: This table specifies the analysis of the third quartile accumulated in the first half of the year from 2008 to 2016.

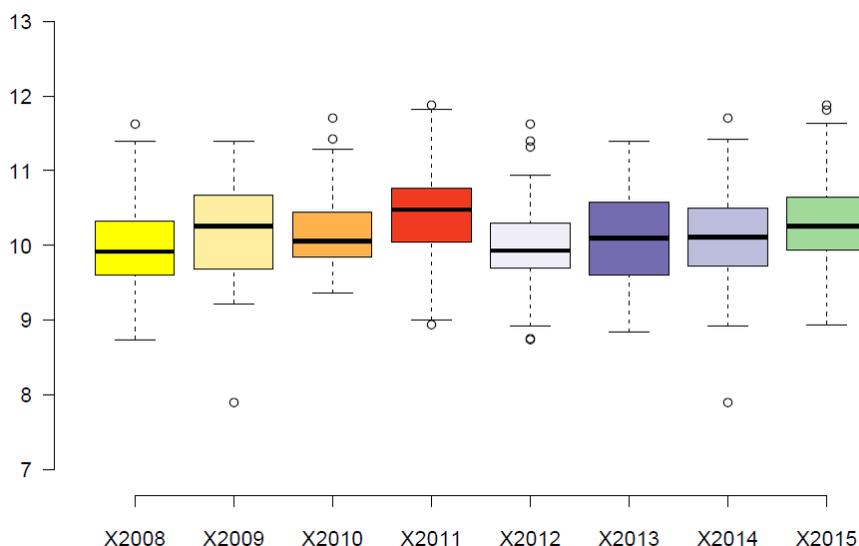
median (365 points) was slightly higher than in the other years, x with 50% of the data between 339 (1st quartile) and 392 points (3rd quartile), but in general the data between the 1st quartile and the 3rd quartile is very homogeneous.

Regarding the analysis of the results obtained by Psychology students from 2012 to 2016 of the Saber Pro test, it should be clarified that the results of the years 2008 to 2015 are presented in the first instance, since the MEN through the ICFES made

a change of assessment in the scale of the test for the year 2016, thus the results of the year 2016 are presented independently (see Table 4 and Figure 3).

The results of the Saber Pro averages were in a range between 9.96 and 10.46. In 2011, there was the highest average (10.46) and the highest median (10.48). Likewise, it was observed that in 2011, 50% of the data were the highest of all those compared in a range between 10.04 (1st quartile) and 10.76 (3rd quartile).

**Figure 4.**  
Saber Pro Averages 2008-2015



Source: Own elaboration.

**Table 5**  
Quartiles of Saber Pro Averages 2008-2015

	2008	2009	2010	2011	2012	2013	2014	2015
Upper whisker	11.40	11.40	11.28	11.82	10.94	11.40	11.42	11.64
3rd quartile	10.33	10.67	10.44	10.76	10.30	10.58	10.50	10.64
Median	9.92	10.26	10.06	10.48	9.93	10.10	10.11	10.26
1st quartile	9.60	9.69	9.84	10.04	9.70	9.60	9.72	9.94
Lower whisker	8.74	9.22	9.36	9.00	8.92	8.84	8.92	8.94
Nr. of data points	71.00	55.00	55.00	57.00	70.00	74.00	90.00	70.00

Note: This table specifies the analysis of the first quartile accumulated in the average of the Saber Pro tests from 2008 to 2015.

**Table 6**  
Descriptive Data of Saber Pro 2016 Averages

Year	Obs	Total	M	S	DE	Min	25%	Me	75%	Max	Mo
2016	94	14673	156,09	363,01	19,05	92	144	156	168	205	151

Note: The table shows the data of the Saber Pro test averages for 2016.

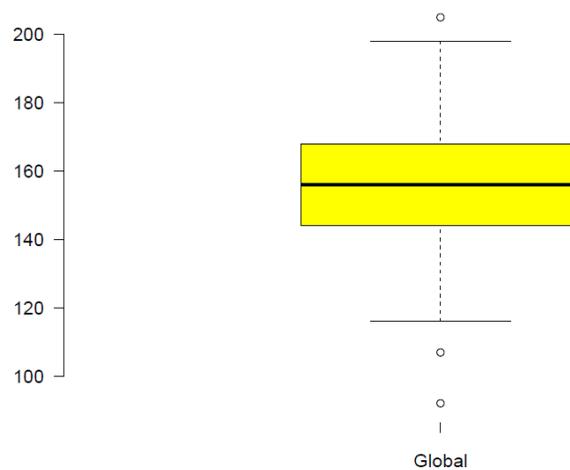
In 2016, Saber Pro scores were presented on a scale between 0 and 300 (see Table 9 and 10). Ninety-four students participated.

A minimum of 92 and a maximum of 205 points were obtained. The mean score was 156. It is observed that 50% of the scores were between 144 and 168 points.

In the interpretation of the results obtained in the admission exam, the cumulative academic average, the academic average of the first semester of the career and the Saber Pro test from the years 2012 to 2016. For the

analysis of the variables, a Pearson correlation, and a multiple linear regression and logistic were performed from the 2009 to 2011 cohorts, since the admission test scores were not provided for 2008.

**Figure 5.**  
Saber Pro 2016 Scores



Source: Own elaboration.

**Table 7**  
Quartiles of Saber Pro 2016 Scores

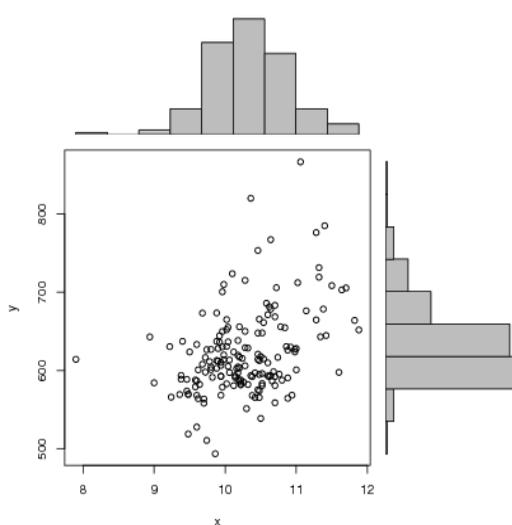
Min	25%	Median	75%	Max
92	144	156	168	205

Note: This table shows the quartiles of scores between 25% and 75% corresponding to the 2016 Saber Pro test.

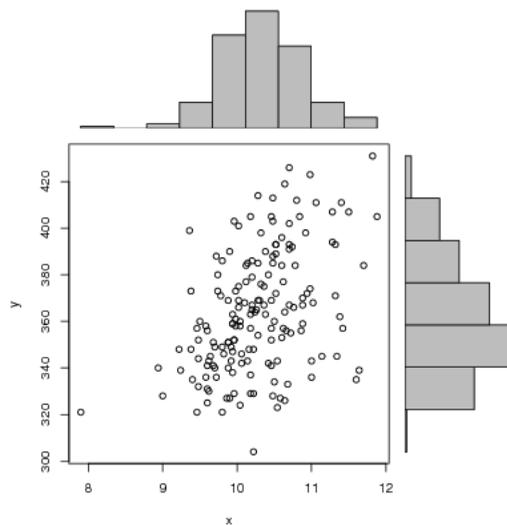
**Table 8**  
Pearson Correlation Analysis Between Saber Pro Cohorts 2009 and 2011 Admission Scores, Admission Test Scores, Cumulative First Semester and Overall Cumulative

	Saber Pro 2009-2011
Saber Pro	1
Admission score	0,40 (p < 0,001)
Accumulated 1st semester	0,42 (p < 0,001)
Overall cumulative average	0,48 (p < 0,001)

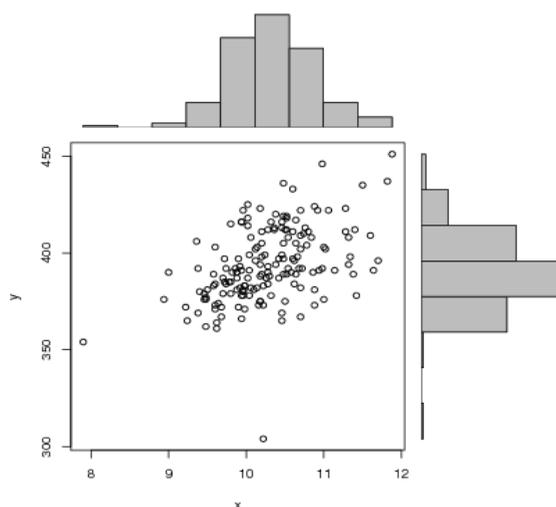
Note: This table shows the results of the Pearson correlation analysis between Saber Pro cohorts 2009 and 2011 admission scores, admission test scores, cumulative first semester and overall cumulative (1 and p < 0.001).



**Figure 6.** Pearson Correlation Between Saber Pro Scores, 2009-2011 Entrance Cohorts, X-axis and Admission Scores (Y-axis).  $r = 0.40$  ( $p < 0.001$ )



**Figure 7.** Pearson Correlation Between Saber Pro Scores, 2009-2011 Entrance Cohorts, X-axis, and 1st Semester Cumulative (Y-axis).  $r = 0.42$  ( $p < 0.001$ )



**Figure 8.** Pearson Correlation Between Saber Pro Scores, 2009-2011 Entrance Cohorts, X-axis, and Overall Cumulative Average (Y-axis).  $r = 0.48$ , ( $p < 0.001$ )

Source: Own elaboration.

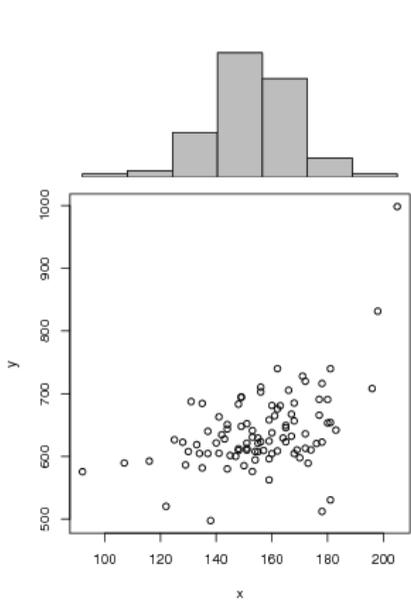
The three variables had a statistically significant correlation, which would indicate that there is a directly proportional correlation between the variables.

**Table 9**

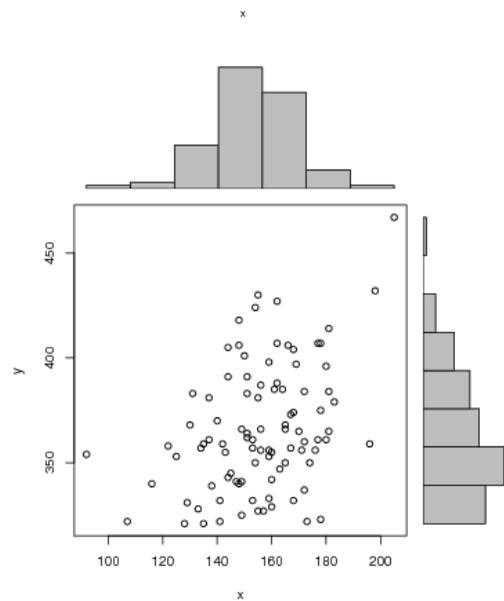
*Pearson Correlation Analysis Between Saber Pro Scores Submitted in 2016 of the 2012 Cohort and Admission Scores, 1st Semester Cumulative and Overall Cumulative Career Average..*

Saber Pro score	1
Admission score	0,46 (p < 0,001)
Accumulated 1st semester	0,378 (p < 0,001)
Overall cumulative average	0,38 (p < 0,001)

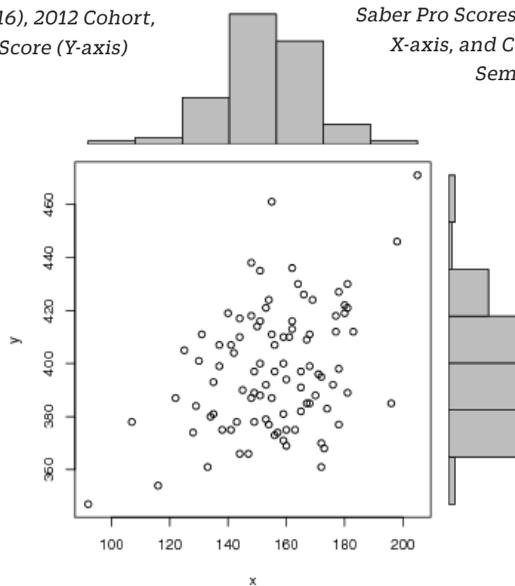
*Note: This table shows the Pearson's correlation between Saber Pro scores with a value of 1, admission scores 0.46 (p < 0.001), 1st semester cumulative 0.378 (p < 0.001) and overall cumulative career average 0.38 (p < 0.001).*



**Figure 9.** Pearson Correlation Between Saber Pro Scores (year 2016), 2012 Cohort, X-axis, and Admission Score (Y-axis)



**Figure 10.** Pearson Correlation Between Saber Pro Scores (year 2016), 2012 Cohort, X-axis, and Cumulative of the First Semester (Y-axis)



**Figure 11.** Pearson Correlation Between Saber Pro Scores (year 216), 2012 Cohort, X-axis, and Overall Cumulative Average (Y-axis)

Source: Own elaboration.

The three variables had a statistically significant correlation, indicating that there is a directly proportional relationship between the variables.

Since there were significant statistical correlations between the continuous variables analyzed, the respective multiple linear regression analyses were performed between the same variables. The linear regression was performed between the results of the Saber Pro tests and the admission scores, the accumulated of the 1st semester and the overall accumulated and in this multiple linear regression model, taking as dependent variable (Y) the results of the Saber Pro-2016 tests and the independent or predictor variables: admission score, the accumulated of the 1st semester, and the overall accumulated average, a determination coefficient  $R^2 = 0.26$  is observed, indicating that this model with the three predictor variables would explain 26% of the results of the Saber Pro tests.

The validation of this model was performed with the analysis of variance where an  $F = 10.79$  ( $p < 0.05$ ) was obtained being statistically significant, where it was observed that only the independent variable (X) admission score was statistically significantly related to the variable  $Y =$  Saber Pro test.

## Discussion

In the sociodemographic characterization of the psychology students of the Universidad del Magdalena, it was observed that about 70% of the students are women and come from public schools, about 60% come from the department of Magdalena and about 80% belong to strata 1 and 2. At the level of admission scores, the maximum average was 640 in the year 2012; in the accumulated 1st semester, the maximum average was 366 in the year 2012; in the overall accumulated, the maximum average was 401 in the year 2011; and in the Saber Pro tests the maximum average was 10.45, tests presented between 2012 and 2015; and the average of the Saber Pro tests presented in the year 2016 was 156.

When multivariate analyzes were performed having as response variable the results from the Saber-Pro tests, for the 2009-2011 admission cohorts, the statistically significant predictor variables were admission score and overall cumulative average, where these two variables would explain 31% of the Saber-Pro results.

In the multivariate analyses for the 2012 entrance cohort with Saber Pro tests presented in 2016, two statistically significant models were evidenced; thus, the 1st model was between Saber Pro scores and admission scores and overall cumulative average; and the 2nd model was between Saber Pro scores and admission scores and 1st semester average. In both models, the predictor variables would explain about 25% of the Saber Pro test results.

It can be concluded that the admission scores and cumulative GPA variables would explain between 26 and 31% of the Saber Pro test results, in the admission cohorts from 2009 to 2012.

In the multivariate analyses for the 2012 entrance cohort with Saber Pro tests presented in 2016, two statistically significant models were evidenced as follows: the 1st model was between Saber Pro scores and admission scores and overall cumulative average (see table 3, 4, 5, and 6); and the 2nd model was between Saber Pro scores and admission scores and 1st semester average (see table 3), in both models the variables would explain about 25% of the Saber Pro test results.

It can be concluded that the admission scores and cumulative overall average variables would explain between 26 and 31% of the results of the Saber Pro tests, in the entrance cohorts from 2009 to 2012.

In the multivariate analyses for the 2012 entrance cohort with Saber Pro tests presented in 2016, two statistically significant models were evidenced as follows: the 1st model was between Saber Pro scores and admission scores and overall cumulative average (see table 3, 4, 5, and 6); and the 2nd model was between Saber Pro scores and admission scores and 1st semester average (see table 3), in both models the variables would explain about 25% of the results of the Saber Pro tests.

In the analysis of the 2012 admission cohort by chi-square between the Saber Pro results and the score and sociodemographic variables,

a statistically significant association was only observed between the Saber Pro quartiles and the admission score quartiles. For the above reason, logistic regression analysis was not performed, since only a single predictor variable (X) was statistically related to the explanatory variable (Y), Saber Pro.

In Colombia, studies have been carried out in relation to the academic performance of university students, taking as references the variables Saber 11 tests, admission scores, cumulative academic average, and Saber Pro tests; likewise, a great diversity of sociodemographic variables have been considered, including sex, socioeconomic stratum, and origin of the school. However, the analyses for finding a single predictive model are diverse; this could be explained either by the sample size and by factors intrinsic to the universities and/or regions. A relationship between our results and those of other studies in Colombia ([Osma et al., 2014](#), [Tapasco et al., 2016](#); [Melo et al., 2017](#)) are presented below.

In 2014, it was learned about the factors associated with the results of the Saber Pro 2010 tests of civil engineering students throughout Colombia, where a total of 15,364 students were analyzed and it was concluded that there is an association between Saber Pro scores above the average and being male, being an engineering student in a public institution, having parents with university studies, and being from middle and high strata ([Osma et al., 2014](#)). This information contrasts with that found in this research where it was indicated that the average and median in general of the data found between the 1st quartile and the 3rd quartile are very homogeneous, taking into account that more than 70% are female, which is not associated with the score, since, when analyzing the data for each year that the students took the tests, they were homogeneous, taking into account the sex variable (see Table 3 and Figure 1).

In 2016, the work carried out by the Universidad de Caldas on the relationship between Saber 11 test scores and the academic performance of university students of the 2008-2012 cohorts, revealed that, in the variables of sex, stratum, type of school, origin, and average score of all programs, it was found that the Saber 11 test

score had a weak correlation with academic performance. Also, by logistic regression analysis, significant associations were found between Saber Pro tests and being female, high socioeconomic stratum, higher admission score, and a young age ([Tapasco et al., 2016](#)), in comparison with the data of this research.

In Table 4 and 5, an overall accumulated average is observed, with scores between 341 (year 2013) and 401 points (year 2011), which explains that, from 2013 to 2016, there has been a lower median, as well as 50% of the accumulated, that is, the data between the 1st quartile and the 3rd quartile agrees with the accumulated average between the years 2008 and 2012, which were in a range between 389 and 401 points, being the years with the highest average. Therefore, the logistic regression analysis of the 2009-2011 entrance cohort between the variables showed a single statistically significant model between the Saber Pro tests and the predictor variables accumulated in the 1st semester and the accumulated average in general.

It was also analyzed in this model that students who presented a 1st semester cumulative equal to or higher than 359 points had 2.67 times of achieving a Saber Pro test average higher than 10.15, and students who presented an overall cumulative average equal to or higher than 390 points had 3.24 times of achieving a Saber Pro test average higher than 10.15.

Recently, in 2017, a national analysis in Colombia on university performance observed with different variables highlighted that the socioeconomic stratum and the parents' level of education is reflected in the academic performance of students in different academic programs ([Melo et al., 2017](#)). This would be suggesting that the performance of students in their university academic programs and in the Saber Pro tests would be restricted to the factors surrounding the student such as socioeconomic stratum and the level of education of their parents, in addition to other factors that are inherent to universities, such as admission criteria for teachers, research, and administration.

It is concluded that the results found in the Psychology program are analyzed as internal

processes, therefore, when analyzing the variables between the period 2009-2011, these had a statistically significant correlation with Saber Pro 1; admission score 0.40 ( $p < 0.001$ ); cumulative 1st semester 0.42 ( $p < 0.001$ ) and overall cumulative average 0.48 ( $p < 0.001$ ) (See Table 11).

Likewise, the analysis was performed with the period 2012-2016 with the Saber Pro 1 score together with the admission score 0.46 ( $p < 0.001$ ); the cumulative 1st semester 0.378 ( $p < 0.001$ ), and overall cumulative average 0.38 ( $p < 0.001$ ) (see Table 8 and 9), which indicates a directly proportional relationship between the variables that were analyzed, as well as the type and degree of organizational participation and responsibilities between teachers and students and in the achievement of goals, which gives indications of the quality on which the organization's objectives are based. In addition, it invites to design and adjust improvement plans based on the results of the evaluation.

This analysis invites management, teachers, and students to continue participating actively in the construction of a quality education. In turn, the attitudes of teachers and students towards evaluation indicate motivation, either to express themselves and life plans, autonomy to manage their own progress, and indicators of teachers' teaching competencies. This helps to find a methodology that approaches an ideal state of measurement and an assessment of the intellectual capital acquired through a training process, leading to review two points that are the culmination of intermediate level studies (Saber11) and the completion of higher-level studies (Saber Pro).

It is recommended that institutions consider the results of the Saber Pro assessment in the curriculum committee for analysis. The training process of the course is not to prepare for the exam, but to evaluate the students taught and their learning style. The teaching and the way to evaluate the knowledge from the training and training of the special skill and the general skill and profile to be evaluated.

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